

WHAT IS CLAIMED IS:

1. A contactor which is used for testing electric characteristics of an object to be tested, said contactor comprising

5 a contactor board;

a plurality of conductive members formed through the contactor board;

10 a plurality of beam members each having a tip and a base end at its both ends in which at least a conductive layer is provided between both the ends and each beam member has a step between the tip and the base end, which is connected to each conductive member; and

15 a contact terminal member provided at the tip of each beam member in which the contact terminal member is formed integrally with the conductive layer of the beam member.

20 2. The contactor according to claim 1, wherein the contact terminal member is mainly formed of essentially the same material as the conductive layer of the beam member.

25 3. The contactor according to claim 2, wherein the conductive layer comprises one selected from the group consisting of nickel, copper, titanium, palladium, platinum, gold, tungsten, alloys of these metals, and compounds of these metals.

4. The contactor according to claim 1, wherein

the contact terminal member comprises a high-hardness  
conductive metal, an alloy or metal compounds thereof.

5        5. The contactor according to claim 4, wherein  
the high-hardness conductive metal is selected from  
titanium, tungsten, and alloys and metal compounds  
thereof.

6. A method for manufacturing the contactor  
described in claim 1 to form a beam member and a  
contact terminal member, comprising the steps of:

10        forming a recess in a silicon substrate, said  
recess having such a cross section that deepens  
according to a pattern corresponding to a step shape of  
the beam member and being deepest at its bottom;

forming a silicon layer on said recess;

15        forming a hole having a shape corresponding to the  
contact terminal member at the deepest position in said  
recess; and

20        forming a deposition on the silicon layer and the  
hole to constitute the conductive layer of the beam  
member and the contact terminal member.

7. The method for manufacturing the contactor  
according to claim 6, wherein the step of forming the  
silicon layer comprises doping with boron.

25        8. The method for manufacturing the contactor  
according to claim 6, which further comprises a step of  
directly joining the base end of the beam member to the  
conductive member of the contactor board.

9. The method for manufacturing the contactor according to claim 8, wherein the joining is anode joining.

10. A probe card for testing electric characteristics of an object to be tested, comprising;  
5 a contactor described in claim 1;

a card board having a plurality of second conductive members arranged corresponding to the plurality of conductive members of the contactor; and

10 an electric connection member interposed between the contactor and the card board, said electric connection member serving to electrically interconnect each conductive member of the contactor and each second conductive member of the card board.

15 11. The probe card according to claim 10, wherein said electric connection member has a cushioning structure.

20 12. The probe card according to claim 10, wherein said electric connection member is formed by a deposition process.

13. The probe card according to claim 10, wherein said electric connection member has an essentially  $\Omega$ -shaped structure.

25 14. The probe card according to claim 11, wherein said contactor board is an insulating board.

15. The probe card according to claim 10, wherein an elastic film is interposed between the contactor

board and the card board.

16. A contactor which is used to test electric characteristics of an object to be tested, comprising;

a contactor board;

5 at least one conductive member formed through the contactor board;

at least one beam member, which has one of a step shape and a slope shape and has its base end connected to the conductive member; and

10 a contact terminal member provided at a tip of the beam member.

17. The contactor according to claim 16, wherein said beam member has a conductive layer, and said

15 contact terminal member is formed integrally with the conductive layer of the beam member.

18. The contactor according to claim 16, wherein said step-shaped beam member comprises a plurality of step portions and a coupling portion for coupling these step portions,

20 at least one of the plurality of coupling portions couples in an inclined manner the two step portions disposed above and below the coupling portions.

19. The contactor according to claim 16, wherein said conductive member has a frusto-conical shape, and  
25 the base end of the beam member is connected to the surface of the frusto-cone having a larger area.